



SEQUENCE LISTING

#8

<110> IVERSON, BRENT  
GEORGIOU, GEORGE  
CHEN, GANG  
OLSEN, MARK J.  
DAUGHTERY, PATRICK S.

<120> DIRECTED EVOLUTION OF ENZYMES AND ANTIBODIES

<130> MXGN:005USC2

<140> 09/813,444

<141> 2001-03-20

<150> 08/847,063

<151> 1997-05-01

<160> 53

<170> PatentIn Ver. 2.1

<210> 1

<211> 780

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
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tct gtg cgc atg tcc tgc aaa tcc tca ggg tac att ttc acc gac ttc 96  
Ser Val Arg Met Ser Cys Lys Ser Ser Gly Tyr Ile Phe Thr Asp Phe  
20 25 30

tac atg aat tgg gtt cgc cag tct cat ggt aag tct cta gac tac atc 144  
Tyr Met Asn Trp Val Arg Gln Ser His Gly Lys Ser Leu Asp Tyr Ile  
35 40 45

ggg tac att tcc cca tac tct ggg gtt acc ggc tac aac cag aag ttt	192
Gly Tyr Ile Ser Pro Tyr Ser Gly Val Thr Gly Tyr Asn Gln Lys Phe	
50 55 60	
aaa ggt aag gcc acc ctt act gtc gac aaa tct tcc tca act gct tac	240
Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Ser Thr Ala Tyr	
65 70 75 80	
atg gag ctg cgt tct ttg acc tct gag gac tcc gcg gta tac tat tgc	288
Met Glu Leu Arg Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys	
85 90 95	
gcc ggc tcc tct ggt aac aaa tgg gcc atg gat tat tgg ggt cat ggt	336
Ala Gly Ser Ser Gly Asn Lys Trp Ala Met Asp Tyr Trp Gly His Gly	
100 105 110	
gct agc gtt act gtg agc tct ggt ggc ggt ggc tcg ggc ggt ggt ggg	384
Ala Ser Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly	
115 120 125	
tcg ggt ggc ggc gga tca gac ata gta ctg acc cag tct cca gct tct	432
Ser Gly Gly Gly Gly Ser Asp Ile Val Leu Thr Gln Ser Pro Ala Ser	
130 135 140	
ttg gct gtg tct cta gga caa agg gcc acg ata tcc tgc cga tcc agc	480
Leu Ala Val Ser Leu Gly Gln Arg Ala Thr Ile Ser Cys Arg Ser Ser	
145 150 155 160	
caa agt ctc gta cat tct aat ggt aat act tat ctg aac tgg tac caa	528
Gln Ser Leu Val His Ser Asn Gly Asn Thr Tyr Leu Asn Trp Tyr Gln	
165 170 175	
cag aaa cca gga cag cca ccc aag ctt ctc atc tat aag gta tcc aac	576
Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn	
180 185 190	
cga ttc tct gga gtc cct gcc agg ttc agt ggc agt ggg tct gag tca	624
Arg Phe Ser Gly Val Pro Ala Arg Phe Ser Gly Ser Gly Ser Glu Ser	
195 200 205	
gac ttc acc ctc acc atc gat cct gtg gag gaa gat gat gct gca ata	672
Asp Phe Thr Leu Thr Ile Asp Pro Val Glu Glu Asp Asp Ala Ala Ile	
210 215 220	
tat tac tgt agc caa act acg cat gtt cca ccc acg ttc ggc tcg ggg	720
Tyr Tyr Cys Ser Gln Thr Thr His Val Pro Pro Thr Phe Gly Ser Gly	
225 230 235 240	

acc aag ctg gag ctg aaa cgt gct agc cag cca gaa ctc gcc ccg gaa 768  
 Thr Lys Leu Glu Leu Lys Arg Ala Ser Gln Pro Glu Leu Ala Pro Glu  
 245 250 255

gac ccc gag gac 780  
 Asp Pro Glu Asp  
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<210> 2  
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 <212> PRT  
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 <223> Description of Artificial Sequence: Synthetic  
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Ser Val Arg Met Ser Cys Lys Ser Ser Gly Tyr Ile Phe Thr Asp Phe  
 20 25 30

Tyr Met Asn Trp Val Arg Gln Ser His Gly Lys Ser Leu Asp Tyr Ile  
 35 40 45

Gly Tyr Ile Ser Pro Tyr Ser Gly Val Thr Gly Tyr Asn Gln Lys Phe  
 50 55 60

Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Ser Thr Ala Tyr  
 65 70 75 80

Met Glu Leu Arg Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys  
 85 90 95

Ala Gly Ser Ser Gly Asn Lys Trp Ala Met Asp Tyr Trp Gly His Gly  
 100 105 110

Ala Ser Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly  
 115 120 125

Ser Gly Gly Gly Gly Ser Asp Ile Val Leu Thr Gln Ser Pro Ala Ser  
 130 135 140

Leu Ala Val Ser Leu Gly Gln Arg Ala Thr Ile Ser Cys Arg Ser Ser  
 145 150 155 160

Gln Ser Leu Val His Ser Asn Gly Asn Thr Tyr Leu Asn Trp Tyr Gln

	165	170	175
Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn			
	180	185	190
Arg Phe Ser Gly Val Pro Ala Arg Phe Ser Gly Ser Gly Ser Glu Ser			
	195	200	205
Asp Phe Thr Leu Thr Ile Asp Pro Val Glu Glu Asp Asp Ala Ala Ile			
	210	215	220
Tyr Tyr Cys Ser Gln Thr Thr His Val Pro Pro Thr Phe Gly Ser Gly			
225	230	235	240
Thr Lys Leu Glu Leu Lys Arg Ala Ser Gln Pro Glu Leu Ala Pro Glu			
	245	250	255
Asp Pro Glu Asp			
	260		

<210> 3  
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<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<400> 3  
 tggaccaaca acatcggt

18

<210> 4  
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 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<400> 4  
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26

<210> 5  
 <211> 32  
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 gacccccgagg actaacgtct tcgaataaat ac 32  
  
  
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 <223> Description of Artificial Sequence: Synthetic  
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 ccgaattcgt ttgaacatgc ctaac 25  
  
  
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 <211> 31  
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 <213> Artificial Sequence  
  
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 <223> Description of Artificial Sequence: Synthetic  
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<210> 9  
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 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic  
 Primer

<400> 9  
 ttggctgcag taatatattg cagcat 26

<210> 10  
 <211> 31  
 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic  
 Primer

<400> 10  
 tgcaatatat tactgcagcc aaactacgca t 31

<210> 11  
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 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<400> 11  
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<210> 12  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 12

cttgccaata tatctgcaga aactgccgga a

31

<210> 13

<211> 40

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 13

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<210> 14

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 14

cagggtacat tttcaccg

18

<210> 15

<211> 46

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
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aactgcagcc aannbacgca tnnbccannb acgttcggct cgggga

46

<210> 16

<211> 63  
<212> DNA  
<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
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<400> 16  
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gct 63

<210> 17  
<211> 30  
<212> DNA  
<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 17  
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<210> 18  
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<212> DNA  
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<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 18  
tacattttca ccgacttcaa tatgaattgg gttcgc 36

<210> 19  
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<212> DNA  
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<223> Description of Artificial Sequence: Synthetic  
Primer



<400> 19  
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<210> 20  
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<220>  
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<400> 20  
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<210> 21  
 <211> 36  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<400> 21  
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<210> 22  
 <211> 36  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<400> 22  
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<210> 23  
 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 23

Ser Gln Thr Thr His Val Pro Pro Thr  
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<210> 24

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 24

Ser Gln Ala Thr His Met Pro Gly Thr  
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<210> 25

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 25

Ser Gln Thr Thr His Phe Pro Val Thr  
1 5

<210> 26

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 26

Ser Gln Ala Thr His Tyr Pro Thr Thr

<210> 27

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 27

Ser Gln Cys Thr His Trp Pro Val Thr

1

5

<210> 28

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 28

Ser Gln Thr Thr His Val Pro Pro Thr

1

5

<210> 29

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 29

Ser Gln Ala Thr His Tyr Pro Ser Thr

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5

<210> 30

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 30

Ser Gln Ala Thr His Ser Pro Ser Thr

1

5

<210> 31

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 31

Ser Gln Val Thr His Gly Pro Arg Thr

1

5

<210> 32

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 32

Ser Gln Gly Thr His Arg Pro Tyr Thr

1

5

<210> 33

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 33

Ser Gln Ile Thr His Val Pro Lys Thr

1

5

<210> 34

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 34

Ser Gln Leu Thr His Leu Pro Arg Thr

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5

<210> 35

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 35

Ser Gln Pro Thr His Val Pro Pro Thr

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5

<210> 36

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

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Ser Gln Val Thr His Lys Pro Gly Thr

1

5

<210> 37

<211> 9  
<212> PRT  
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<220>  
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 37  
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<210> 38  
<211> 9  
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<220>  
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 38  
Ser Gln Leu Thr His Gly Pro Arg Thr  
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<210> 39  
<211> 9  
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<223> Description of Artificial Sequence: Synthetic Peptide

<400> 39  
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<210> 40  
<211> 9  
<212> PRT  
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<220>  
<223> Description of Artificial Sequence: Synthetic

Peptide

<400> 40

Ser Gln Glx Thr His Gly Pro Phe Thr

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5

<210> 41

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 41

Ser Ser Gly Asn Lys Trp Ala Met Asp Tyr

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5

10

<210> 42

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 42

Ser Ser Gly Asn Tyr Arg Ala Leu Asp Tyr

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5

10

<210> 43

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 43

Ser Ser Gly Asn Arg Arg Ala Trp Asp Tyr

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5

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<210> 44  
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<210> 45  
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<210> 46  
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 <223> Description of Artificial Sequence: Synthetic  
           Peptide  
  
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<210> 47  
 <211> 10  
 <212> PRT  
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<220>

<223> Description of Artificial Sequence: Synthetic Peptide

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<210> 48

<211> 9

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic Peptide

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Ser Gln Thr Thr His Val Pro Pro Thr  
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<210> 49

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 49

Ser Gln Val Thr His Arg Pro Leu Thr  
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<210> 50

<211> 9

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic Peptide

<400> 50

Ser Gln Val Thr His Asp Pro Gly Thr

<210> 51

<211> 9

<212> PRT

<213> Artificial Sequence

<220> .

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 51

Ser Gln Val Thr His Cys Pro Ser Thr

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5

<210> 52

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 52

Ser Gln Val Thr His Trp Pro Pro Thr

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5

<210> 53

<211> 9

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
Peptide

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Ser Gln Val Thr His Tyr Pro Val Thr

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ggg tac att tcc cca tac tct ggg gtt acc ggc tac aac cag aag ttt	192
Gly Tyr Ile Ser Pro Tyr Ser Gly Val Thr Gly Tyr Asn Gln Lys Phe	
50 55 60	
aaa ggt aag gcc acc ctt act gtc gac aaa tct tcc tca act gct tac	240
Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Ser Thr Ala Tyr	
65 70 75 80	
atg gag ctg cgt tct ttg acc tct gag gac tcc gcg gta tac tat tgc	288
Met Glu Leu Arg Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys	
85 90 95	
gcc ggc tcc tct ggt aac aaa tgg gcc atg gat tat tgg ggt cat ggt	336
Ala Gly Ser Ser Gly Asn Lys Trp Ala Met Asp Tyr Trp Gly His Gly	
100 105 110	
gct agc gtt act gtg agc tct ggt ggc ggt ggc tcg ggc ggt ggt ggg	384
Ala Ser Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly	
115 120 125	
tcg ggt ggc ggc gga tca gac ata gta ctg acc cag tct cca gct tct	432
Ser Gly Gly Gly Gly Ser Asp Ile Val Leu Thr Gln Ser Pro Ala Ser	
130 135 140	
ttg gct gtg tct cta gga caa agg gcc acg ata tcc tgc cga tcc agc	480
Leu Ala Val Ser Leu Gly Gln Arg Ala Thr Ile Ser Cys Arg Ser Ser	
145 150 155 160	
caa agt ctc gta cat tct aat ggt aat act tat ctg aac tgg tac caa	528
Gln Ser Leu Val His Ser Asn Gly Asn Thr Tyr Leu Asn Trp Tyr Gln	
165 170 175	
cag aaa cca gga cag cca ccc aag ctt ctc atc tat aag gta tcc aac	576
Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn	
180 185 190	
cga ttc tct gga gtc cct gcc agg ttc agt ggc agt ggg tct gag tca	624
Arg Phe Ser Gly Val Pro Ala Arg Phe Ser Gly Ser Gly Ser Glu Ser	
195 200 205	
gac ttc acc ctc acc atc gat cct gtg gag gaa gat gat gct gca ata	672
Asp Phe Thr Leu Thr Ile Asp Pro Val Glu Glu Asp Asp Ala Ala Ile	
210 215 220	
tat tac tgt agc caa act acg cat gtt cca ccc acg ttc ggc tcg ggg	720
Tyr Tyr Cys Ser Gln Thr Thr His Val Pro Pro Thr Phe Gly Ser Gly	
225 230 235 240	

acc aag ctg gag ctg aaa cgt gct agc cag cca gaa ctc gcc ccg gaa 768  
 Thr Lys Leu Glu Leu Lys Arg Ala Ser Gln Pro Glu Leu Ala Pro Glu  
 245 250 255

gac ccc gag gac 780  
 Asp Pro Glu Asp  
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<210> 2  
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 <223> Description of Artificial Sequence: Synthetic  
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Ser Val Arg Met Ser Cys Lys Ser Ser Gly Tyr Ile Phe Thr Asp Phe  
 20 25 30

Tyr Met Asn Trp Val Arg Gln Ser His Gly Lys Ser Leu Asp Tyr Ile  
 35 40 45

Gly Tyr Ile Ser Pro Tyr Ser Gly Val Thr Gly Tyr Asn Gln Lys Phe  
 50 55 60

Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Ser Thr Ala Tyr  
 65 70 75 80

Met Glu Leu Arg Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys  
 85 90 95

Ala Gly Ser Ser Gly Asn Lys Trp Ala Met Asp Tyr Trp Gly His Gly  
 100 105 110

Ala Ser Val Thr Val Ser Ser Gly Gly Gly Ser Gly Gly Gly Gly  
 115 120 125

Ser Gly Gly Gly Gly Ser Asp Ile Val Leu Thr Gln Ser Pro Ala Ser  
 130 135 140

Leu Ala Val Ser Leu Gly Gln Arg Ala Thr Ile Ser Cys Arg Ser Ser  
 145 150 155 160

Gln Ser Leu Val His Ser Asn Gly Asn Thr Tyr Leu Asn Trp Tyr Gln

	165		170		175
Gln Lys Pro Gly Gln Pro Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn					
	180		185		190
Arg Phe Ser Gly Val Pro Ala Arg Phe Ser Gly Ser Gly Ser Glu Ser					
	195		200		205
Asp Phe Thr Leu Thr Ile Asp Pro Val Glu Glu Asp Asp Ala Ala Ile					
	210		215		220
Tyr Tyr Cys Ser Gln Thr Thr His Val Pro Pro Thr Phe Gly Ser Gly					
225		230		235	240
Thr Lys Leu Glu Leu Lys Arg Ala Ser Gln Pro Glu Leu Ala Pro Glu					
	245		250		255
Asp Pro Glu Asp					
	260				

<210> 3  
 <211> 18  
 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic  
 Primer

<400> 3  
 tggaccaaca acatcggt

18

<210> 4  
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 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Synthetic  
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<400> 4  
 cccatatcac cagctcaccg tctttc

26

<210> 5  
<211> 32  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
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<400> 5  
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<210> 6  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 6  
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<210> 7  
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<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 7  
cggaattcgt gcgcaacacg atgaagctc 29

<210> 8  
<211> 31  
<212> DNA  
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<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 8  
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<210> 9  
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<220>  
<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 9  
ttggctgcag taatatattg cagcat 26

<210> 10  
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<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 10  
tgcaatatat tactgcagcc aaactacgca t 31

<210> 11  
<211> 30  
<212> DNA  
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<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 11  
cggcagtttc tgcagatata ttcgcaagat 30

<210> 12  
<211> 31  
<212> DNA  
<213> Artificial Sequence

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 <223> Description of Artificial Sequence: Synthetic  
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<400> 12  
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<400> 13  
 acgccacatc ttgcgaatat atctgcagaa actgccggaa 40

<210> 14  
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<400> 14  
 cagggtacat tttcacccg 18

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 aactgcagcc aannbacgca tnnbccannb acgttcggct cgggga 46

<210> 16



<211> 63  
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<220>

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Primer

<400> 16  
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gct 63

<210> 17  
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<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 17  
gttaccagag gagccggcgc aatagtatac 30

<210> 18  
<211> 36  
<212> DNA  
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<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 18  
tacatatttca ccgacttcaa tatgaattgg gttcgc 36

<210> 19  
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<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 19  
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<210> 20  
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Primer

<400> 20  
tacattttca ccgacttctc tatgaattgg gttcgc 36

<210> 21  
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Primer

<400> 21  
tacattttca ccgacttcgg gatgaattgg gttcgc 36

<210> 22  
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Primer

<400> 22  
tacattttca ccgacttcta aatgaattgg gttcgc 36

<210> 23  
<211> 9  
<212> PRT  
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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 23

Ser Gln Thr Thr His Val Pro Pro Thr

1

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<210> 24

<211> 9

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 24

Ser Gln Ala Thr His Met Pro Gly Thr

1

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<210> 25

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 25

Ser Gln Thr Thr His Phe Pro Val Thr

1

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<210> 26

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 26

Ser Gln Ala Thr His Tyr Pro Thr Thr

1

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<210> 27

<211> 9

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 27

Ser Gln Cys Thr His Trp Pro Val Thr

1

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<210> 28

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 28

Ser Gln Thr Thr His Val Pro Pro Thr

1

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<210> 29

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 29

Ser Gln Ala Thr His Tyr Pro Ser Thr

1

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<210> 30

<211> 9

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 30

Ser Gln Ala Thr His Ser Pro Ser Thr  
1 5

<210> 31

<211> 9

<212> PRT

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 31

Ser Gln Val Thr His Gly Pro Arg Thr  
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<210> 32

<211> 9

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 32

Ser Gln Gly Thr His Arg Pro Tyr Thr  
1 5

<210> 33

<211> 9

<212> PRT

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 33

Ser Gln Ile Thr His Val Pro Lys Thr

1

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<210> 34

<211> 9

<212> PRT

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<223> Description of Artificial Sequence: Synthetic  
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<400> 34

Ser Gln Leu Thr His Leu Pro Arg Thr

1

5

<210> 35

<211> 9

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 35

Ser Gln Pro Thr His Val Pro Pro Thr

1

5

<210> 36

<211> 9

<212> PRT

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 36

Ser Gln Val Thr His Lys Pro Gly Thr

1

5

<210> 37

<211> 9  
<212> PRT  
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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 37

Ser Gln Leu Thr His Trp Pro Ser Thr  
1 5

<210> 38

<211> 9

<212> PRT

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<223> Description of Artificial Sequence: Synthetic  
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<400> 38

Ser Gln Leu Thr His Gly Pro Arg Thr  
1 5

<210> 39

<211> 9

<212> PRT

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 39

Ser Gln Leu Thr His Gly Pro Arg Thr  
1 5

<210> 40

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic

Peptide

<400> 40

Ser Gln Glx Thr His Gly Pro Phe Thr

1

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<210> 41

<211> 10

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 41

Ser Ser Gly Asn Lys Trp Ala Met Asp Tyr

1

5

10

<210> 42

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 42

Ser Ser Gly Asn Tyr Arg Ala Leu Asp Tyr

1

5

10

<210> 43

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 43

Ser Ser Gly Asn Arg Arg Ala Trp Asp Tyr

1

5

10



<210> 44  
<211> 10  
<212> PRT  
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<220>  
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Peptide

<400> 44  
Ser Ser Gly Asn Arg Arg Ala Leu Asp Tyr  
1 5 10

<210> 45  
<211> 10  
<212> PRT  
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Peptide

<400> 45  
Ser Ser Gly Asn Gly Arg Ala Trp Asp Tyr  
1 5 10

<210> 46  
<211> 10  
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Peptide

<400> 46  
Ser Ser Gly Asn Ile Ser Ala Leu Asp Tyr  
1 5 10

<210> 47  
<211> 10  
<212> PRT  
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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 47

Ser Ser Gly Asn Gln Arg Lys Met Asp Tyr

1 5 10

<210> 48

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 48

Ser Gln Thr Thr His Val Pro Pro Thr

1 5

<210> 49

<211> 9

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 49

Ser Gln Val Thr His Arg Pro Leu Thr

1 5

<210> 50

<211> 9

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 50

Ser Gln Val Thr His Asp Pro Gly Thr

1

5

<210> 51

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 51

Ser Gln Val Thr His Cys Pro Ser Thr

1

5

<210> 52

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 52

Ser Gln Val Thr His Trp Pro Pro Thr

1

5

<210> 53

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 53

Ser Gln Val Thr His Tyr Pro Val Thr

1

5